UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,659	10/08/2003	Kit S. Lam	8141/11803	9161

7590 10/12/2006

Audrey A. Millemann
Weintraub Genshlea Chediak Sproul
11th Floor
400 Capitol Mall
Sacramento, CA 95814

EXAMINER	
WESSENDORF, TERESA D	

ART UNIT	PAPER NUMBER
1639	

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/682,659	LAM ET AL.	
	Examiner	Art Unit	
	T. D. Wessendorf	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 10-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 10-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/23/06 has been entered.

Status of Claims

Claims 1-4 and 10-14 are pending and under examination.

Withdrawn Rejection

In view of the amendments to the claims the rejections in the last Office under 35 USC 112, first and second paragraphs are withdrawn.

Claim Rejections - 35 USC § 112

Claims 3, 5, 10 and 13, as amended, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 is a duplicate of claim 3 since the same ligand having identical structure is being claimed. It is unclear how the same compound, which binds specially to ***non-epithelial*** cancer cells can also bind specifically to ***epithelial*** cancer cells. Likewise, claim 13 is a duplicate of claim 11 since claim 13 has identical compound sequence as claim 11.

Double Patenting

Claims 1-4 and 10-14, as amended and added, are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 8 of U.S. Patent No. 6,670,142 ('142 Patent). Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claimed ligand is similar to the ligand in the '142. The instant claimed ligand encompasses the ligand of the '142 patent. The instant ligand includes "modified" amino acids. However, said "modified" amino acid would obviously be covered by the '142 unnatural amino acids. [The instant specification does not define a differentiating characteristic of a modified from an unnatural amino acid.]

Response to Arguments

Applicants state that a terminal disclaimer will be filed after the rejections of the pending claims on grounds have been resolved.

In reply, in the absence of a terminal disclaimer, the rejection is maintained.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e))

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3 and 11 rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gopalakrishnakone (US 7094575).

Gopalakrishnakone discloses a ligand which has a peptide sequence as disclosed in Seq. ID. 9 (i.e., positions 6-13). Gopalakrishnakone further discloses at col. 26, Table 6, D-amino and unnatural acid substitutions for the amino acid residues. The claimed function of binding to epithelial or non-epithelial cancer cells is a property considered inherent to the compound of Gopalakrishnakone and would have been obvious to determine.

> Where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. See In re Ludtke, supra. Whether the rejection is based on "inherency" under 35 USC 102, on "prima facie obviousness" under 35 USC 103, jointly or alternatively, the burden of proof is the same as is evidenced by the PTO's inability to manufacture products or

to obtain and compare prior art products. See In re Brown, 59 CCPA 1036, 459 F.2d 531, 173 USPQ 685 (1972); In re Best 195 USPQ 430 (CCPA 1977).

Claims 1-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable either over Ruoslahti (USP 6933281) or Rajotte (USP 6784153) alone or in view of Arap (US 20040170955).

Ruoslahti discloses at Table 2, the compound ligand CKGQGDWC (54) in the lung.

Ruoslahti at col. 27, lines 5-24:

> In addition, an organ homing molecule of the invention can have an inherent activity of binding a particular target molecule such that a corresponding ligand cannot bind the receptor. It is known, for example, that various types of cancer cells metastasize to specific organs or tissues, indicating that the cancer cells express a ligand that binds a target molecule in the organ to which it metastasizes. Thus, administration of a lung homing molecule, for example, to a subject having a tumor that metastasizes to lung, can provide a means to prevent the potentially metastatic cancer cell from becoming established in the lung. In general, however, the organ homing molecules of the invention are particularly useful for targeting a moiety to a selected organ or tissue, particularly to lung, skin, pancreas, retina, prostate, ovary, lymph node, adrenal gland, liver or gut. Thus, the invention provides methods of treating a pathology in a selected organ or tissue by administering to a subject having the pathology a conjugate comprising an organ homing molecule of the invention linked to a therapeutic agent.

Ruoslahti discloses at col. 2, lines 65-68:

> FIGS. 2A to 2D show the selectivity of phage displaying a lung (FIGS. 2A and B), skin (FIG. 2C) or pancreas (FIG. 2D) homing peptides.

Ruoslahti at col. 26, lines 7-20:

> The route of administration of an organ molecule will depend, in part, on the chemical structure of the organ homing molecule. Peptides, for example, are not

particularly useful when administered orally because they can be degraded in the digestive tract. However, methods for chemically modifying peptides to render them less susceptible to degradation by endogenous proteases or more absorbable through the alimentary tract are well known (see, for example, Blondelle et al., supra, 1995; Ecker and Crooke, supra, 1995; Goodman and Ro, supra, 1995). Such methods can be performed on peptides that home to a selected organ or tissue. In addition, methods for preparing libraries of peptide analogs such as peptides containing D-amino acids; peptidomimetics consisting of organic molecules that mimic the structure of a peptide; or peptoids such as vinylogous peptoids, have been previously described above and can be used to identify homing molecules suitable for oral administration to a subject.

Rajotte discloses at Table 2, the compound CKGQGDWC (54)

Rajotte further discloses at col. 7, lines 40-55:

For convenience, the term "peptide" is used broadly herein to mean peptides, polypeptides, proteins and fragments of proteins. Other molecules useful in the invention include peptoids, peptidomimetics and the like. With respect to the organ or tissue homing peptides of the invention, peptidomimetics, which include chemically modified peptides, peptide-like molecules containing nonnaturally occurring amino acids, peptoids and the like, have the binding activity of an organ homing peptide upon which the peptidomimetic is derived (see, for example, "Burger's Medicinal Chemistry and Drug Discovery" 5th ed., vols. 1 to 3 (ed. M. E. Wolff; Wiley Interscience 1995), which is incorporated herein by reference). Peptidomimetics provide various advantages over a peptide, including that a peptidomimetic can be stable when administered to a subject, for example, during passage through the digestive tract and, therefore, useful for oral administration.

Rajotte discloses at col. 28, lines 40-57:

The route of administration of an organ molecule will depend, in part, on the chemical structure of the organ homing molecule. Peptides, for example, are not particularly useful when administered orally because they can be degraded in the digestive tract. However, methods

> for chemically modifying peptides to render them less susceptible to degradation by endogenous proteases or more absorbable through the alimentary tract are well known (see, for example, Blondelle et al., supra, 1995; Ecker and Crooke, supra, 1995; Goodman and Ro, supra, 1995). Such methods can be performed on peptides that home to a selected organ or tissue. In addition, methods for preparing libraries of peptide analogs such as peptides containing ***D-amino acids;*** peptidomimetics consisting of organic molecules that mimic the structure of a peptide; or peptoids such as vinylogous peptoids, have been previously described above and can be used to identify homing molecules suitable for oral administration to a subject.

See also col. 4, Fig. 1.

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a D-cys in the compound ligand of either Ruoslahti or Rajotte. Each of these references discloses that a D-residue is stable and less subject to enzyme degradation when administered orally.

Each of Ruoslahti or Rajotte does not disclose the different natural amino acids as claimed. However, Arap discloses at paragraph [0094]:

> The term "protein or peptide" encompasses amino acid sequences comprising at least one of the 20 common amino acids found in naturally occurring proteins, or at least one modified or unusual amino acid, including but not limited to those shown on Table 1.

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the natural amino acids in the compound of either

Ruoslahti or Rajotte with a modified or unusual amino acids as taught by Arap. Such replacement is conventionally done in the art as taught by Arap and would motivate one having ordinary skill in the art since the modified residues would reasonably be expected to have improved properties.

Claims 10 and 12-13 are free of prior art.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to T. D. Wessendorf whose telephone number is(571) 272-0812. The examiner can normally be reached on Flexitime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Paras can be reached on (571) 272-4517. The fax phone number for the organization where this application or proceeding is assigned is 571 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

T. D. W

T. D. Wessendorf
Primary Examiner
Art Unit 1639

tdw
September 29, 2006